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EVARO

Environmental

Assessment

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FINDING PROPOSED EVARO TIMBER SALE

An interdisciplinary team (ID Team) has completed the Environmental Assessment (EA) for the proposed Evaro Timber Sale by the Montana Department of Natural Resources and Conservation. After a review of the EA, project file, public correspondence, Department policies, standards and guidelines, and the State Forest Land Management Plan (SFLMP), I have made the following decisions:

1. ALTERNATIVE SELECTED

Two alternatives are presented and were fully analyzed in the EA: Alternative A, the No Action Alternative, and Alternative B, the action alternative. Alternative B proposes to harvest approximately 1.0 MMBF over 220 acres. The No Action Alternative would not cut any timber.

For the following reasons, I have selected Alternative B without additional modifications:

- a. Alternative B meets the Purpose of Action and the specific project objectives listed in the EA on page 3. Alternative B produces more return to the School Trust while providing for desired future conditions of the timber stands.
- b. The analysis of identified issues did not reveal information compelling the Department not to implement the timber sale.
- c. Alternative B includes activities to address environmental concerns identified during project scoping.

2. SIGNIFICANCE OF IMPACTS

For the following reasons, I find that the Alternative B will not have significant impacts on the human environment:

- a. Old growth and snags: No stands in the project area currently meet old growth requirements. The planned harvest would focus on removing the smaller suppressed trees on the site and would retain the majority of large trees and snags. Snags in the project area would be left whenever possible except for safety reasons and in areas of road construction and landings. Snag recruits would be left in the entered stands to provide for future use.
- b. Movement corridors: The chosen action alternative would retain movement corridors through the section which provides connectivity to Marent Gulch in the south.
- c. Winter range: Retention of big game cover in the southeastern and southwestern portions of the project area would maintain cover. Retaining larger diameter trees with larger crowns would provide snow interception for large portions of the project area. Habitat retention in the areas adjacent to the winter range openings in the southern portion of the project area with the movement corridor provided provides security cover.

d. Water quality: The proposed action alternative would improve a chronic sediment source that was identified on the main access road. This improvement is expected to result in improvements to water quality and improved protection of beneficial uses. No new stream crossings are planned.

e. Cumulative watershed effects: The harvesting of approximately 220 acres and the building of approximately one mile of new road would not result in exceeding any water yield thresholds.

f. Cold water fisheries: Improvements to the existing road system to mitigate existing problems are expected to reduce the risk of additional impacts to fisheries. The proposed road improvement is expected to reduce sediment delivery to streams and not cause a barrier to fish passage.

g. Soil productivity: Potential loss of soil nutrients would be mitigated by retaining fine litter and return skidding of slash, or in-woods processing. Harvest mitigation measures such as skid trail planning and season of use would limit potential severe soil impacts.

h. Noxious weeds: Equipment would be cleaned prior to entering the project area. The DNRC would monitor the proposal area for two years after harvest and control infestations as needed.

i. Economics: Alternative B would provide approximately \$245,000.00 in short-term revenue to the school trust and the potential for the treated stands to generate revenue in the long term will be retained.

j. Precedent setting and Cumulative impacts: The project area is located on State owned lands which are "principally valuable for the timber that is on them or for growing timber or for watershed" (MCA 77-1-402). The proposed timber sale is similar to past projects that have occurred in the area. Since the EA does not identify future actions that are new or unusual, the proposed timber sale is not setting precedence for a future action with significant impacts.

Taken individually and cumulatively, the identified impacts of the proposed timber sale are within threshold limits. Proposed timber sale activities are common practices and none of the project activities are being conducted on important, fragile, or unique sites.

The proposed timber sale conforms with the management philosophy adopted by DNRC in the SFLMP and is in compliance with existing laws, policies, guidelines, and standards applicable to this type of proposed action.

3. SHOULD DNRC PREPARE AN ENVIRONMENTAL IMPACT STATEMENT (EIS)?

Based on the following, I find that an EIS does not need to be prepared:

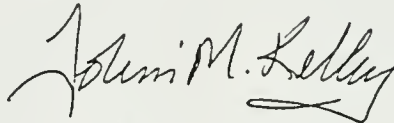
a. The EA adequately addressed the issues identified during project development and

displayed the information needed to make the decisions.

b. Evaluation of the potential impacts of the proposed timber sale indicate that no significant impacts would occur.

c. The ID Team provided sufficient opportunities for public review and comment during project development and analysis.

Tobin M. Kelley

A handwritten signature in cursive script, reading "Tobin M. Kelley". The signature is written in dark ink and is positioned above the printed name and title.

Missoula Unit Forester

Missoula Unit

September 30, 1999

TABLE OF CONTENTS

CHAPTER I PURPOSE OF THE PROJECT	1
PURPOSE OF ACTION.....	1
PROJECT NEED.....	1
LOCATION.....	1
PROJECT OBJECTIVES	2
RELATIONSHIP TO THE STATE FOREST LAND MANAGEMENT PLAN.....	2
OTHER ENVIRONMENTAL ASSESSMENTS (EAS) RELATED TO THIS PROJECT	2
PERMITS, LICENSES AND OTHER AUTHORIZATIONS REQUIRED	2
DECISIONS TO BE MADE FROM THIS EA	3
PUBLIC INVOLVEMENT - AGENCIES, INDIVIDUALS OR GROUPS CONTACTED	3
ISSUES.....	3
<i>Wildlife-related</i>	3
<i>Water-related</i>	4
<i>Soils-related Issues</i>	4
CHAPTER II ALTERNATIVES.....	5
INTRODUCTION	5
DEVELOPMENT OF ALTERNATIVES	5
ALTERNATIVE A-NO ACTION	5
ALTERNATIVE B-HARVEST.....	5
MITIGATION MEASURES IN THE ACTION ALTERNATIVE.....	6
WILDLIFE	6
WATERSHED.....	7
SOILS	7
ROADS.....	7
WEEDS	8
TABLE 2-2. SUMMARY OF ENVIRONMENTAL CONSEQUENCES.....	8
CHAPTER III AFFECTED ENVIRONMENT	11
INTRODUCTION	11
WILDLIFE	11
<i>Old Growth and Snags</i>	11
<i>Movement Corridors</i>	14
<i>Winter Range Considerations</i>	14
WATERSHEDS.....	15
<i>Cumulative Watershed Effects - Existing Conditions</i>	16
<i>Water Quality</i>	17
<i>Cold Water Fisheries</i>	17
SOILS	18
<i>Soil Productivity</i>	18
<i>Noxious Weeds</i>	19
SENSITIVE PLANTS	19
CHAPTER IV--ENVIRONMENTAL CONSEQUENCES.....	20
INTRODUCTION	20
WILDLIFE	20
<i>Old Growth and Snags</i>	20
<i>Winter Range</i>	23
WATERSHED.....	23
<i>Cumulative watershed effects</i>	23
<i>Water Quality</i>	25

<i>Cold Water Fisheries</i>	26
SOILS	26
<i>Soil Productivity</i>	26
<i>Noxious Weeds</i>	26
ECONOMICS	27
APPENDIX A	28
ASSESSING OLD GROWTH: COARSE FILTER AND APPROPRIATE CONDITIONS	28
OLD-GROWTH COMMITMENTS FROM THE SFLMP	28
APPENDIX B	29
ENDANGERED AND THREATENED SPECIES	29
<i>Bald Eagle (federally-threatened)</i>	29
<i>Grizzly Bear (federally-threatened)</i>	30
<i>Gray Wolf (federally-endangered)</i>	31
SENSITIVE SPECIES CONSIDERATIONS	32
<i>Pileated Woodpecker</i>	32
<i>Flammulated Owl</i>	33
<i>Lynx</i>	35
<i>Fisher</i>	35
<i>Boreal Owl</i>	35
<i>Townsend's Big-eared Bat</i>	37
OTHER SENSITIVE SPECIES	37
<i>Black-Backed Woodpecker</i>	37
<i>Coeur d'Alene Salamander</i>	37
<i>Columbian Sharp-Tailed Grouse</i>	37
<i>Common Loon</i>	37
<i>Ferruginous Hawk</i>	38
<i>Harlequin Duck</i>	38
<i>Northern Bog Lemming</i>	38
<i>Mountain Plover</i>	38
OTHER SPECIES OF INTEREST	38
<i>Goshawk</i>	38
<i>Literature Cited</i>	40

CHAPTER I PURPOSE OF THE PROJECT

PURPOSE OF ACTION

This environmental assessment shall address a proposed timber sale on state school trust lands administered by the Montana Department of Natural Resources and Conservation. The sale under consideration would harvest approximately 1.0 million board feet of timber from 220 acres using a single tree selection silvicultural prescription. Harvest could begin as early as July 2000 and would be completed no later than February 2003.

PROJECT NEED

The lands involved in this proposed project are held by the State of Montana in trust for the support of specific beneficiary institutions. These include public schools, state colleges and universities, and other specific state institutions such as the school for the deaf and blind (Enabling Act, February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and Department of Natural Resources and Conservation (DNRC) are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate advantage over the long run for these beneficiary institutions (Section 77-1-202, MCA). On May 30, 1996, the Department released the Record of Decision on the State Forest Land Management Plan (SFLMP). The Land Board approved the SFLMP's implementation on June 17, 1996. The SFLMP outlines the philosophy of DNRC for the management of state forested trust lands, and lists specific Resource Management Standards for ten resource categories.

The Department will manage the lands involved in this project according to the philosophy and standards in the SFLMP, which states the following:

Our premise is that the best way to produce long-term income for the trust is to manage intensively for healthy and biologically diverse forests. Our understanding is that a diverse forest is a stable forest that will produce the most reliable and highest long-term revenue stream. In the foreseeable future timber management will continue to be our primary source of revenue and our primary tool for achieving biodiversity objectives (DNRC, SFLMP Record of Decision 1996 [ROD-1]).

LOCATION

Section 36, T 15 N., R 20 W., Missoula County

The proposed sale is located on the southern boundary of the Flathead Indian Reservation, approximately 10 miles northwest of Missoula, Montana. The 640-acre project area is within both the Finley Creek watershed of the Flathead River, and the O'Keefe Creek watershed of the Clark Fork River.

Section 36 has been fragmented with 6 clearcut units, 10 to 36 acres in size. Prior to that harvest, logged stands were similar in age and structure to the current forest stands. Harvest occurred in 1989. Approximately 50 acres in the southwestern corner have not been recently logged, and are composed of a mix of pole-sized ponderosa pine and Douglas-fir, scattered openings, and remnant old larch and Douglas-fir trees. The south-central portion of the section has somewhat

larger, natural openings that are important as big game winter range when weather is severe. Forested areas between the clearcuts range from doghair lodgepole pine stands to pockets of old aged larch, Douglas-fir, and ponderosa pine. Mistletoe occurs in lodgepole pine, western larch, and Douglas-fir. Large snags and snag recruits are limited because of past harvest. The best snags are located in the unentered stands. Knapweed occurs along the road and in open stands in the southern part of the section. Some south-facing slopes have locally heavy infestations of knapweed.

PROJECT OBJECTIVES

In order to meet the goals of the management philosophy adopted through programmatic review in the SFLMP, the Department has set the following specific project objectives:

Harvest between 0.5 and 1.2 million board feet (MMBF) of sawtimber to generate a net positive rate of return for the Common School (CS) grant.

To manage the forest for appropriate or desired future conditions, characterized by the proportion and distribution of forest types and structures typical of those represented under average historic conditions.

RELATIONSHIP TO THE STATE FOREST LAND MANAGEMENT PLAN

In June 1996, DNRC began a phased-in implementation of the SFLMP. The SFLMP established the agency's philosophy for the management of forested trust lands. The management direction provided in the SFLMP comprises the framework within which specific project planning and activities take place. The SFLMP philosophy and appropriate resource management standards have been incorporated into the design of the proposed action.

OTHER ENVIRONMENTAL ASSESSMENTS (EAS) RELATED TO THIS PROJECT

Northside Analysis Area, Environmental Assessment, 1993. Missoula Ranger District, U.S.D.A. Forest Service, Lolo National Forest. Missoula, MT

Flat-Pardee, Tarkzeau, Tyler Creek, and West Lubrecht EAs, Missoula Unit, DNRC. West Lubrecht EA covers 3 timber sales: West Lubrecht, Greenough, and Potomac.

PERMITS, LICENSES AND OTHER AUTHORIZATIONS REQUIRED

Other state, federal, or tribal agencies that have jurisdiction or review responsibility are as follows:

The Confederated Salish and Kootenai Tribes (CSKT), road use agreement.

The Confederated Salish and Kootenai Tribes (CSKT), Aquatic Lands Conservation Ordinance Permit

DECISIONS TO BE MADE FROM THIS EA

1. Determine if alternatives meet the objectives of the project.
2. Determine which alternative should be selected.
3. Determine if the selected alternative has a significant impact on the human environment.
4. Determine if an Environmental Impact Statement (EIS) is required.

PUBLIC INVOLVEMENT - AGENCIES, INDIVIDUALS OR GROUPS CONTACTED

Comments from the general public, interest groups, and agency specialists were solicited as part of this EA. Legal notices were run in the Missoulian on July 31, August 7 and 14, 1998. Public notices were posted from early August to September 15, 1998 in the Evaro area, along access roads to the project area, and near adjacent landowners. Two written comments were received that encouraged timber harvest and increased scrutiny of cost-effectiveness. One commentor requested that existing trails be kept open and encouraged additional planting in some old harvest units that are not fully stocked. One commentor expressed several concerns and requested consideration be given to the following issues: road maintenance, cumulative impacts, cost to benefit ratios, socio-economic consideration, environmental justice, threatened and endangered species, noxious weeds, impacts on recreational use and hunting by tribal members, and scenic quality concerns.

ISSUES

The following issues were identified during the scoping process. They constitute the basis for the formation of project specifications, development of mitigation measures, and assessment of environmental impacts.

Wildlife-related

Old Growth and Snags

Concerns were raised that timber harvest and associated road building can remove components of old growth such as large-sized snags and large-sized live trees with defects that eventually may be recruited as snags and coarse woody debris. Harvest can also fragment old growth patches. As a result, habitats can be rendered less suitable or unsuitable for species that are associated with old growth and snags. Old growth ecosystems are complex and generally require the passage of considerable time to be recreated. Therefore, the loss of old growth and snag habitats and their attendant wildlife species is a concern.

Movement Corridors

Retention of overstory cover that may provide movement corridors is a concern. Harvest removes overstory canopy cover that may fragment habitats and potentially disrupt movement corridors. For some species that are associated with a high degree of canopy cover (such as lynx, fisher, and marten), harvest can render habitats less suitable or unsuitable. This is particularly important where previous harvest has altered the surrounding landscape.

Winter Range

The retention of winter range integrity is a concern because harvest can decrease cover, and associated road building can decrease habitat security. Harvest can also increase noxious weeds, which reduces winter range quality for big game. In general, noxious weeds are less palatable, less nutritious, and provide poorer cover for wildlife than native plant species. In this document, the soils section will discuss noxious weeds.

Water-related

Water Quality

Concerns were raised that land management activities such as timber harvest and road construction can impact water quality by accelerating sediment delivery to streams above natural levels. These impacts are produced from roads, skid trails, landings, removal of vegetation along stream channels, and by installation of stream crossing structures.

Cumulative Watershed Effects

Concerns were raised that potential cumulative watershed effects include impacts to water quality and quantity that result from the interaction of past and current activities and the proposed action. Timber harvesting and other activities can affect the timing of runoff, increase peak flows and increase the overall water yield of a drainage. Increased peak flows and/or duration of peak flows may result in physical damage to stream channels causing instability, loss of fish habitat and downstream water quality impact.

Cold Water Fisheries

Concerns were raised that land management activities such as timber harvest and road construction can impact cold water fisheries habitat by accelerating sediment delivery to streams, increasing water temperature, reducing potential recruitment of large woody debris, and reducing fish passage. These impacts are caused by sediment produced from roads, skid trails and landings, removal of vegetation along streams, and by the installation of stream crossing structures.

Soils-related Issues

Soil Productivity

Concerns were raised that equipment operations during timber harvest on sensitive soils (steep slopes and wet sites) can result in soil rutting, compaction and displacement, and erosion.

Concerns were raised that long-term soil productivity can be reduced depending on area and degree of physical effects, and amount and distribution of coarse woody debris retained for nutrient cycling.

Concerns were raised that road drainage, and construction and reconstruction methods may negatively affect soil resources. To avoid negative effects, use Best Management Practices (BMPs) and maintenance of existing roads.

Noxious Weeds

Concerns were raised that noxious weeds can spread with ground disturbance, road construction and reconstruction, and traffic.

CHAPTER II ALTERNATIVES

INTRODUCTION

The purpose of Chapter 2 is to describe the alternatives and compare the alternatives by summarizing the environmental consequences.

DEVELOPMENT OF ALTERNATIVES

Alternatives were planned through scoping and development of issues, input from Interdisciplinary Team (IDT) specialists, and guidance from resource management standards from the SFLMP. In addition, compliance with trust mandates helped to shape alternatives.

Alternative A-No Action

Under the no action alternative, no harvest would occur at this time. Current activities such as fire suppression and livestock grazing would continue. The no action alternative can be used as a baseline to compare the environmental consequences of the action alternatives.

Alternative B-Harvest

The proposed harvest would remove suppressed lodgepole pine and Douglas-fir trees, as well as larger Douglas-fir with mistletoe, leaving 0-100 (average 30-50) square feet of basal area/acre after harvest. Approximately 220 acres would be harvested in this proposal. Some areas are not available for harvest now because of past clearcut treatment (Table 2-1). Nearly all (90%) of the large sized (greater than 18 inches d.b.h.) ponderosa pine and mistletoe-free western larch would be retained. None would be planned for removal, although some would likely be harvested for logistic considerations (for example, if the tree were in the path of a planned road or landing). Large western larch trees with mistletoe that occur in clumps of several infected trees would be retained for wildlife habitat. Individual large larch with mistletoe would usually be removed. Some large Douglas-fir would be retained as well, although fewer than western larch or ponderosa pine. Most Douglas-fir with mistletoe would be removed unless the infected tree was particularly large and contained important wildlife habitat qualities. Specifically, large-sized Douglas-fir, including those with mistletoe would be retained in the southwestern portion of the project area adjacent to stand 6 (Figure 2-1). This would retain habitat structural diversity in an area that has been fragmented by harvest in stand 6 and by adjacent Forest Service harvest in Section 35.

Large diameter trees, especially ponderosa pine and western larch are not common in the project area, primarily as a result of historic logging. Under historic conditions, large seral trees would have survived many of the periodic ground fires that burned through the area. Large diameter pine and larch can provide important habitat for cavity nesting birds and other species. Large diameter Douglas-fir trees provide good snow interception for animals on winter range. Biodiversity Resource Management Standard #4 of the Statewide Forestland Management Plan states, "On areas of smaller or scattered ownership, activities would be based on restoring a semblance of historic conditions within state ownership."

FIGURE 2-1



EXISTING ROAD



NEW TEMPORARY ROAD



OLD CLEARCUT UNITS

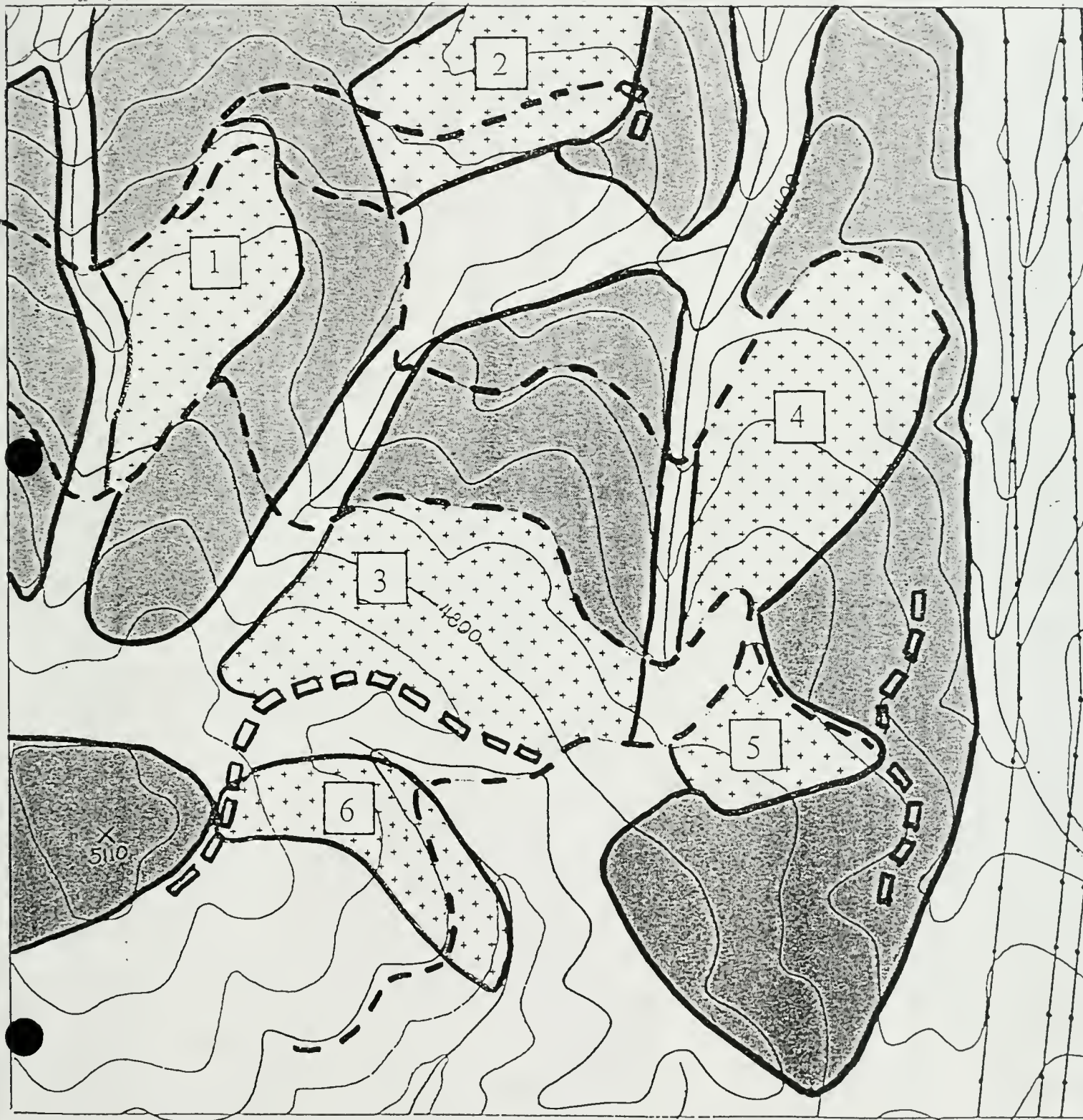


PROPOSED HARVEST UNIT



SCALE 8" = 1 MILE

CONTOUR INTERVAL = 80 FT.



Proposed harvest would create some openings and bypass some thickets of smaller trees, resulting in vegetation "clumps" and habitat diversity. Approximately ½ to ¾ mile of new temporary road would be built. Slash would be placed on new road surfaces after hauling is finished, essentially obliterating roads from travel via walking, biking or vehicles. To control potential spread of spotted knapweed, roads would be sprayed at the end of harvest activities. Winter range openings in the southeastern corner of the section would be sprayed if funding were secured. Overstory cover would be retained between current clearcut units 3 and 6, the two most southern units. This would provide potential movement corridors for wildlife. No harvest would occur in those areas (Figure 2-1). Slash would be return skidded and left scattered throughout treatment areas, but away from leave trees. The southwestern corner of the section would not be entered. Most of the treated areas would be burned after harvest, weather and funding permitting.

**Table 2-1. Summary of Past and Proposed Treatment
Alternative B, Proposed Evaro Timber Sale**

Previously Clearcut	Currently Occupied by Roads	Currently Occupied by Power Line Right of Way	To be Harvested	To Remain Unharvested	Total Area
ACRES					
124.4	7.6	40	220	248	640

MITIGATION MEASURES IN THE ACTION ALTERNATIVE

Wildlife

- Return skid slash to harvest units
- All newly constructed roads would be closed by "slashing".
- All roads remaining passable would be sprayed for weeds after harvest.
- Retain clumps of Douglas- fir over 20" with mistletoe in the southwestern portion of the project area adjacent to Section 35 and the previously-harvested stand 6
- Where large-sized (greater than 18 inches) western larch trees with mistletoe occur in a clump of several trees, the clump would be retained for wildlife habitat.
- If any threatened or endangered species were encountered during project planning or implementation, all project-related activities would cease and a DNRC wildlife biologist would be informed immediately. Additional habitat protection measures would be designed and implemented as appropriate.
- Prior to logging, the DNRC would confirm the current wolf status in the vicinity with the U.S. Fish and Wildlife Service, Helena.
- If active nests of an owl or other raptor were located within the project area, activities would stop until the biologist and the sale administrator could visit the site. Nest trees and all overstory trees in a 100-foot radius would be retained. Timing restrictions or other nest stand protections may be implemented as well.

Watershed

- Implement Forestry BMPs as the minimum standard for all operations associated with the proposed timber sale.
- Provide for adequate road surface drainage on all temporary or abandoned roads that will not require periodic maintenance.
- Protect ephemeral draws, springs, and other wet areas with marked equipment restriction zones. If absolutely necessary, designate locations for skid trail crossings. Use designated crossings only under dry or frozen conditions.
- Comply with all stipulations set forth in the Aquatic Lands Conservation Ordinance (ALCO), 124 permits, Montana SMZ Law and Rules, and any site-specific alternative practices granted under the SMZ Law and Rules.

Soils

- We would implement restrictions on season of use. Limit operations to periods when soils are relatively dry, frozen to 3" deep, or snow covered to at least 12" deep.
- The logger and sale administrator would agree to a general skidding plan prior to equipment operations. Limit tractor ground skidding to slopes less than 45%, unless using a soft track yarder (FMC). On ground skidding units less than 35% slope, rubber tired skidders are preferred. Grapple cats will be limited to slopes less than 30% unless on designated skid trails at least 50 ft. apart.
- Harvest units on slopes over 45% will be cable harvested to protect soil and water resources.
- For long term soil productivity, avoid displacement and minimize scarification to 30-40% of sites were required for silvicultural needs. Leave 10-15 tons large woody debris for nutrient cycling and to maintain long -term soil productivity.

Roads

- Complete an access road inventory to identify appropriate drainage required to comply with BMPs.
- All new roads for cable harvest units should be 14 ft. wide to allow for line machine access. Make road cutslopes at stable angles of 1:1 for common material, and as steep as the slope will stand for bedrock.
- Construct all new roads with adequate drainage and rolls in grade. Maximum grade should not exceed 8% except for short pitches. Use Erosivity Index (EI) of 30 for general spacing of road drainage features.
- Road construction on slopes over 35% will require an excavator for pioneer road construction.
- Grass seed new road cutslopes, fillslopes and landings within 10 days of rough shaping with site adapted grass.

Weeds

- Road right-of-way (R/W) user will be responsible for weed control concurrent with their use.
- All road construction and harvest equipment would be cleaned of plant parts, mud and weed seed to prevent the introduction of noxious weeds. Equipment would be inspected by the forest officer prior to moving on site.
- All newly-disturbed soils on road cuts and fills would be promptly reseeded to site adapted grasses to reduce weed encroachment and stabilize roads from erosion.
- Weed treatment measures may include spot herbicide treatment of noxious weeds. Where herbicide treatments are required by the forest officer, herbicide must be applied under the supervision of a licensed applicator following label directions in accordance with Department of Agriculture regulations, applicable laws, and rules and regulations of the Missoula County weed board.
- Monitor the sites for 2 years to evaluate weed control measures implemented and determine if any new noxious weeds establish that were not previously identified.

Environmental effects from both alternatives are summarized in Table 2-2.

Table 2-2. Summary of Environmental Consequences

Issue	Alternative A-No Action	Alternative B-Harvest
Old Growth And Snags	With competition stress, trees would die. Old growth components and snags would increase in the near-term. However, trees in unthinned stands would not be expected to grow as large as trees in thinned stands. If trees do not grow to at least 18 inches, then the benefit to both old growth attributes and snags in the future would be lower than if trees grew larger. In addition, there is some risk to loss due to stand-replacing fire. In the analysis area, lands to the north and east of the project area have little old growth or snag habitat. Unharvested lands to the west and south likely have more snag habitat and more old growth components.	Harvest would remove dense understory trees. All large-sized ponderosa pine and western larch would be retained (except those removed for road, skid trail, or landing construction, and some larch with mistletoe). This would potentially recruit old growth ponderosa pine and large-sized trees and snags faster than growing trees without thinning. In addition, risk of loss due to stand-replacement fire would be reduced in treated stands. Faster recruitment and reduced risk of loss are both direct benefits to old growth and snag resources. The area adjacent to stand 6 (which was previously harvested) would retain large-sized Douglas-fir with mistletoe. This important old growth component would increase structural diversity in that area, a benefit to old growth resources. Some snags would likely be removed, due to safety considerations for humans. However, retaining safe snags, retaining trees with defect, and thinning to potentially recruit snags for the future would mitigate this. Approximately 1/2 to 2/3 of the analysis area has been previously harvested, so old growth components and snag habitat is lower there than if the lands were not harvested. With mitigations, there would be no cumulative negative effects to old growth and

Issue	Alternative A-No Action	Alternative B-Harvest
		snag habitats from this alternative. There would be a cumulative benefit to both habitats by thinning now.

Issue	Alternative A-No Action	Alternative B-Harvest
Winter Range	In the project area, there would be no change from current conditions except that trees would gradually grow and understories would become denser. Cover would continue to increase, and forage would continue to decrease. No controlled burning would occur, a negative effect to forage resources. Cover adjacent to foraging areas would remain intact, a benefit to habitat security. However, vehicle trespass would continue to occur, a negative effect to security. In the analysis area, ample forage is available, but residual cover is fragmented to the east and immediately-adjacent area west of the project area.	Harvest would decrease cover for big game, a negative effect to this habitat component. However, cover would remain intact in unentered areas. These include draws, habitat adjacent to the winter range openings in the southern portion of the project area, and potential movement corridors at the head of Marent Gulch. In addition, cover would remain unentered between units 3 and 6 (which were previously clearcut). This would benefit big game use there. New roads would be slashed after use, so security would not decrease after harvest. Trespass roads would be effectively closed, a benefit to security. Thinning would decrease the risk of stand-replacement fire, a benefit to big game cover. Thinning would stimulate tree growth, so that crowns would increase, a benefit to snow interception for big game. In the analysis area, cover is fragmented to the east of the project area. However, project planning has retained cover in close proximity to the winter range openings in the southern portion of the analysis area. Therefore, there would be no negative cumulative effect to winter range habitat as a result of the proposal. There would be a cumulative benefit to producing trees for snow interception by implementing the action alternative.
Water Quality	Chronic sediment source identified on main access road will continue to deliver sediment to a tributary of Finley Creek.	The proposed improvement of the main access road is expected to result in long term improvements to downstream water quality and improved protection of beneficial uses in the affected watershed. There is little risk of adverse impacts to beneficial uses

		occurring as a result of the proposed action.
Cumulative Watershed Effects	Water yield under current conditions is estimated at 5.8% over normal.	Cumulative water yield is expected to increase to 7.2% over naturally occurring conditions—well within DNRC established thresholds.
Cold Water Fisheries	No effects to fisheries are predicted under the no action alternative	Implementation of the SMZ Law and Rules, best management practices and site specific recommendations of the DNRC soil scientist and hydrologists will minimize the potential impacts of the proposed action on the cold water fisheries in the affected streams. The proposed road improvement is expected to reduce sediment delivery to streams without causing a barrier to fish passage.
Soils Productivity	No change in existing compaction of the area, occurring on old skid trails and landings. Slow increase of CWD.	Harvest mitigation measures (e.g., skid trail planning and limits on season of use) would limit severe soil impacts to 15% or less of harvest area. Mitigation measures would retain fine litter and CWD for nutrient cycling by use of in-woods processing or return skidding of slash. However, potential negative effects to soil nutrients would be adequately mitigated.
Noxious Weeds	Gradual increase in weed density over time.	Possible increase in noxious weed density and occurrence. Herbicide treatment of roads and infested areas will mitigate noxious weed spread.
Economics	No return to trust from timber harvest. Current grazing lease would continue to return approximately \$20 annually.	1.0 million board feet harvest \$245.00 per mbf \$245,000 including stumpage and forest improvement payments. Current grazing lease would continue to return approximately \$20 annually.

CHAPTER III AFFECTED ENVIRONMENT

INTRODUCTION

This chapter discusses the existing environment and includes effects of past and ongoing management activities within the analysis area.

Wildlife

Area Definitions for Wildlife-Related Issues

The "project area" refers to Section 36 T15N/R20W. The cumulative effects analysis area ("analysis area") refers to the landscape surrounding the project area. The analysis area extends west to Highway 93, north to Mercer Lane, east to the ridge on the Flathead Indian Reservation boundary, and south to the open slopes of Marent Gulch (Figure 3-1).

Old Growth and Snags

Existing Conditions in the Project Area

Currently, the project area contains large-sized western larch and Douglas-fir trees, some with mistletoe. Large-sized snags are limited, and the best snags are in the previously unentered stands. Over 80 species of wildlife found in the Interior Columbia Basin depend on snags, coarse woody debris, and trees with decay or brooms for nesting, roosting, feeding or loafing sites (Bull et al. 1997). None of the project area currently meets the working definition of old growth: *stands 150 years and older (140 years for lodgepole pine) that contain a minimum of 4 thousand board feet (4 MBF) net per acre, and exhibit a range of structural attributes associated with old age*. Past wildfire and logging have resulted in stands of 100 years or less. Prior to harvest in 1989, stands were similar in age and structure to the currently uncut stands. Therefore, none of the section was recently dominated by old growth. Currently, unlogged stands have components of old growth such as large-sized trees (greater than 18 inches) and snags that are important for wildlife. Large trees are scattered in stands, but do not dominate any areas. In old cutting units, snags and snag recruits for the near-term are rare to absent. The largest forested patch in the section is approximately 100 acres, so that even if it were optimal old growth habitat, it would have less utility than larger patches with less edge and more interior (Figure 3-1, #1). Because the oldest stands are only 100 years old, it would take at least 50 years for any areas (40 years for lodgepole) to meet the working definition of old growth.

Existing Conditions Resulting from Cumulative Effects of Past Harvest in the Analysis Area

The eastern portion of the analysis area includes harvested stands on the Flathead Indian Reservation (Figure 3-1, #2). No old growth habitat occurs in those stands. Some relatively unharvested stands occur between the project area and the Reservation harvest units (Figure 3-1). Based on air photo interpretation, the area is likely not old growth. In addition, a power line corridor that is relatively long and narrow (approximately 1 mile long and ¼ mile wide) bisects the analysis area (Figure 3-1, #3). Therefore, much of the habitat east of the project area is edge with little interior. Farms, hayfields, and houses dominate the northern portion of the analysis area (Figure 3-1, #4). No large patches of old growth occur in that area.

Southwest of the project area is open grassland habitat (Figure 3-1, #5). However, a narrow band of potential old growth occurs in this area along the north-facing slope of Marent Gulch (Figure 3-1, #6). Marent Gulch forms a natural corridor between the project area and unharvested habitats to the west. Although the north-facing slope of Marent Gulch is long and narrow (1/4 mile wide or less) it is adjacent to an extensive, unlogged south-facing slope (Figure 3-1, #7). This south-facing slope is naturally open-grown, but contains large-sized trees. It is also contiguous with an uncut slope facing the town of Evaro (immediately northwest of the project area, Figure 3-1, #8). Immediately west of the project area in Section 35 is a portion of the 1993 Lolo National Forest Northside Timber Sale (Figure 3-1, #9). The treatment was shelterwood cutting and covered 100 acres (Decision Notice, Dave Stack, District Ranger, 29 October 1993). Post-harvest basal area appears to be approximately 40 square feet/acre, average. The photo shown in Figure 3-1 was taken prior to the harvest recently completed on Forest Service lands.

The uncut area northwest of the project area occurs in the south half of Section 26 and the north west portion of Section 35 (Figure 3-1, #8). The area is individual private and Plum Creek ownership. From the aerial photograph, the area appears to have old growth components throughout, but is composed of thick doghair stands as well. Taken together as a large patch, these areas currently offer good potential old growth and snag habitat in the analysis area. However, that could change in the future.

Existing Conditions, Missoula Unit

Current old growth acres by cover type for the Missoula Unit, and amounts of old growth to be retained to meet State Forest Land Management Plan (SFLMP) biodiversity guidelines are listed in Table 3-1. "Appropriate conditions" are derived from a model that classifies stands into cover types that emphasize shade intolerant (i.e., sun loving) species present (Appendix A). Because no stands are mapped as old growth in the project area, there will be no effects analysis to current old growth in Chapter 4. However, Chapter 4 will discuss proposed harvest in young to mature stands and how that relates to recruiting old growth components in the future.



**Table 3-1. APPROPRIATE CONDITIONS and ACRES of OLD GROWTH
by COVER TYPE, MISSOULA UNIT**

	APPROPRIATE CONDITIONS ¹ (a)	½ HISTORICAL LEVELS OF OLD GROWTH ¹ (b)	MINIMUM OLD GROWTH (a X b) (c)	CURRENT OLD GROWTH ² (d)	DEVIATION FROM OLD GROWTH COMMIT- TMENT (d-c)
	ACRES	PERCENT	ACRES		
COVER TYPE ¹					
ALP/NC	1300	10.0	130	591	461
DF	7909	2.9	229	3787 ³	3558
HW	0	0	0.0	77	77
LP	1867	1.8	34	5	-29
MC	834	21.8	182	471	289
NONCOM	0	0	0	0	0
PP	36421	27.4	9979	8129	-1850
WL/DF	14629	16.8	2458	4002	1544
WWP	287	13.0	37	0	-37
TOTAL	63247		13049	17062	4013

¹ See Appendix A for definitions.

² Total is the cumulative effect after implementation of Flat-Pardee, Tarkzeau, West Lubrecht, Potomac, and Greenough Timber Sales, which have not all been logged yet. Approximately 239 acres in those sales were entered old growth ponderosa pine stands that meet the working definition of old growth post-harvest. Also included are 105 acres of old growth Douglas-fir that were in "ponderosa pine appropriate" stands. These acres were harvested and converted to old growth ponderosa pine.

³ Amount may decrease by a maximum 52 acres after implementation of proposed Tyler Creek Timber Sale.

Missoula Unit currently has 1850 fewer acres of old growth ponderosa pine type than necessary to meet the minimum SFLMP commitment (Table 3-1). Three stands in the project area are "ponderosa pine appropriate" and could potentially become old growth ponderosa pine. However, they are relatively young: 30 years (stand 8, 40 acres), and 100 years (stand 9, 27 acres and stand 12, 49 acres). Therefore, there would be no opportunity to increase old growth ponderosa pine for the Missoula Unit in the project area now. With time, the stands could grow to old growth, however. Another option to meet the SFLMP commitment for old growth ponderosa pine occurs in mixed stands of old growth Douglas-fir and ponderosa pine that are classed as "appropriate ponderosa pine". These stands could be converted to old growth ponderosa pine type by removing most of the Douglas-fir. That opportunity does not occur in the project area currently.

Missoula Unit is also deficient in old growth lodgepole pine and western white pine. Neither type occurs in the project area. Therefore, Missoula Unit would have no opportunity to address deficient old growth acres of lodgepole pine or western white pine in the project area.

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Movement Corridors

Section 36 has been previously logged, with 6 old cutting units that total 124.4 acres and that range from 10-36 acres (Figure 2-1). Another 7.6 acres are permanent roads. These roads and harvest units have fragmented the section. However, the project area currently provides canopy cover and potential movement corridors between large patches of forested habitat to the east of the analysis area in the Rattlesnake Wilderness, and habitats to the west of the analysis area in the Ninemile drainage. Corridors would be important for many species, such as grizzly bears, wolves, big game, and furbearers. The largest uncut forest patch in Section 36 is approximately 100 acres and is surrounded by cutting units on 3 sides (Figures 3-1, #1). The patch is contiguous with a small patch of forest in the northern portion of the analysis area (Figure 3-1). However, farther north in the analysis area is a large clearing and ranch area (Figure 3-1, #4). Therefore, these forested patches of overstory cover are somewhat isolated. The largest area of contiguous forest in both the project and analysis areas occurs in the southern portion of Section 36. This portion of the section is adjacent to relatively large patches of unfragmented habitat to the southeast and southwest (Figure 3-1, #10). To the southeast of the analysis area, south of recent cutting on the Flathead Indian Reservation, is a relatively unfragmented forest patch south of TV Mountain on the Lolo National Forest (Figure 3-1, #11). To the southwest, the patch continues along Marent Gulch, an unlogged, natural corridor from Section 36 to the west (Figure 3-1, #6). South of Marent Gulch, the area becomes grassland habitat (Figure 3-1, #5).

Winter Range Considerations

The proposed harvest area contains openings that are important for winter forage during severe winters, and adjacent stands that provide hiding and thermal cover (Bob Henderson, MDFWP, pers. comm., Nov. 12, 1998, Figure 3-1, #12). The openings are in the south-central to southeastern portion of the project area. Forage has low production from lack of burning (U.S.D.A. For. Serv. 1993). Roads are closed into Section 36, but trespass occurs. The section has 3 miles of main road and 1.5 miles of "2 track" road. Spotted knapweed occurs along the main road and in open forested stands in the southern part of the section. Some south-facing slopes have locally heavy infestations of knapweed. The section is contiguous with a large grass-shrub land to the southwest (Figure 3-1, #5), so there is a constant source of knapweed to the area.

In the analysis area, the winter range openings are extensive, generally following along south-facing slopes. Adjacent cover is located along the north-facing slope of Marent Gulch (Figure 3-1, #6).

Table 3-2 Summary of hydrologic characteristics

Watershed	Drainage Area Area (acres)	Channel Type	Trout Fishery
Finley Creek	3473	Class I Perennial	Yes
Marent Gulch	1058	Class III	No

WATERSHEDS

The proposed DNRC timber sale is located in Section 36 T15N R20W near the town of Evaro. This section lies in the headwaters of Finley Creek and Marent Gulch. Finley Creek is a third order tributary to the Jocko River, and Marent Gulch is a first order ephemeral draw draining 1058 acres within the O'Keefe Creek watershed. By the definitions in the Montana Streamside Management Zone Law (77-5-302 MCA), Marent Gulch is categorized as a class III stream due to the fact that it is ephemeral and discontinuous. Ownership in Marent Gulch includes 719 acres on the Lolo National Forest, 205 acres private lands, and 134 acres State owned land.

The analysis area for Finley Creek includes 3473 acres in the headwaters of the Finley Creek watershed. Three unnamed tributaries to Finley Creek drain the proposed harvest area. Finley Creek is discontinuous because it flows subsurface just below the analysis boundary, however, within the analysis area it is considered as a Class 1 stream by the Montana SMZ law definitions due to the presence of fish. Ownership in this watershed is primarily Confederated Salish Kootenai Tribes (CSKT), with 2573 acres (74 % of total). State ownership in this analysis area is 506 acres (15%), all located in Section 36. The remaining 394 (11%) acres are in private ownership.

A preliminary watershed screening was completed for each watershed within the proposed sale area. The following table summarizes the hydrologic characteristics of each watershed within the proposed sale area:

Regulatory Framework

The Finley Creek drainage is classified B-1 in both the Montana Surface Water Quality Standards, and the Confederated Salish Kootenai Tribe Water Quality Standards. The B-1 classification is for multiple use waters suitable for domestic use after conventional treatment, growth and propagation of cold water fisheries, associated aquatic life and wildlife, and agricultural and industrial uses. Among other criteria for B-1 waters, no increases are allowed above naturally occurring concentration of sediment, which will harm or prove detrimental to fish or wildlife. Naturally occurring includes conditions or materials present from runoff on developed land where all reasonable land, soil and water conservation practices have been applied. Reasonable practices include methods, measures or practices that protect present and reasonably anticipated beneficial uses. The State has adopted Forestry Best Management Practices through its Nonpoint Source Management Plan as the principle means of controlling nonpoint source pollution from silvicultural activities.

Sensitive downstream beneficial uses include a surface domestic diversion (WRT 761-w-149279-00), and cold water fisheries with bull trout, and westslope cutthroat trout present in lower Finley Creek (see fisheries section of this report). Other downstream beneficial uses include surface water rights for: irrigation, lawn and garden, stock, and industrial, and ground water rights for: domestic, fish and wildlife.

The Montana Streamside Management Zone (SMZ) Law and rules regulate forest practices that occur adjacent to streams, lakes and other bodies of water. The law prohibits or restricts timber harvest and associated activities within a width of SMZ that varies from 50-100 feet of either side of a stream, depending on the steepness of slope and the class of stream.

The Montana Stream Protection Act (MCA 87-5-501) regulates activities conducted by government agencies that may affect the bed or banks of any stream in Montana. The law provides a mechanism to require implementation of BMPs in association with stream bank and channel modifications carried out by governmental entities. Agencies are required to notify the Department of Fish, Wildlife and Parks (DFWP) of any construction projects, which might damage or modify the natural existing shape and form of any stream.

Cumulative Watershed Effects - Existing Conditions

Commercial timber harvest is the principal activity within the Finley Creek analysis area. Approximately 770 acres of timber harvest has occurred in the recent past within the 3473 acres of combined watershed analysis area. Most of this harvest occurred between 1982 and 1990 on CSKT lands. Approximately 124 acres of timber harvest has occurred recently on DNRC ownership in the area. A detailed watershed analysis was completed for Finley Creek. The analysis was completed to determine the existing watershed conditions, identify existing and potential sources of sediment, and assess the potential for cumulative watershed impacts. The analysis included field reviews conducted to: 1) Inventory stream channel condition and stability, 2) Classify stream reaches by channel geomorphology (Rosgen 1996), 3) Inventory condition of all existing roads on State Land, 4) Complete inventory of all stream crossing structures (bridges and culverts), 5) Identify potential sources of sediment, and 6) Field check and verify harvest data compiled. The analysis also included estimates of natural water yield and predicted increases in average annual water yield due to existing roads and timber harvest. These calculations were completed using the Equivalent Clearcut Area (ECA) method as outlined in Forest Hydrology Part II, USFS Region 1, 1974. The results of that analysis are summarized in the following table:

Table 3-3. Summary of cumulative watershed effects—existing conditions

Watershed	Existing Harvest (Acres)	Existing Roads (Miles)	Existing ECA (Acres)	% W.S. Area In ECA	% Water Yield Increase
Finley Creek	770	32.6	368	10.6	5.8

Equivalent Clearcut Area (ECA) is calculated as a function of area (acres) treated, % of forest crown removed and estimates on the amount of hydrologic recovery due to vegetative regrowth. Recovery values were verified and adjusted by observations made in the field.

Harvest history and road information were compiled using information obtained from Confederated Salish Kootenai Tribes, Department of Natural Resources (DNRC) Hazard Reduction Records, information supplied by the Southwest Land Office of the DNRC, and aerial photo interpretation.

Stream surveys were conducted on all three Finley Creek tributary stream channels draining the proposed sale area using the R1R4 Stream Reach Inventory and Channel Stability Evaluation (Pfankuch 1974). Marent Gulch was evaluated, but on State lands, and for nearly a mile down stream, there is no discernable stream channel. Surface water is present during at least part of the year, but discernable bed and banks are lacking from this reach.

Channel conditions in the two eastern-most streams that drain the sale area and contribute to Finley Creek were found to be in stable condition. Using the stream survey method mentioned above to evaluate stability, these first order perennial tributaries to Finley creek were rated in good condition. Some localized bank instability was noted. This was limited to open areas where cattle access allows for trampling. Immediately downstream from the State section the eastern-most tributary has been disturbed by activities including irrigation diversion, and activities associated with the construction of power lines that parallel the eastern boundary of the State section. Due to these disturbances the stream has formed a new channel that has stabilized over the years since disturbance.

The third, western-most tributary to Finley Creek that drains the sale area is an intermittent stream that raises management concerns. A short reach of this stream (200 feet) runs through a road ditch, where sediment from the road is delivered directly to the stream. This BMP departure occurs on CSK Tribal land along the primary access road to the State lands.

Water Quality

Access to the proposed harvest units is provided by one main road that forks within Section 36. The western-most intermittent tributary to Finley Creek mentioned above crosses this road system. A stream crossing inventory has identified 14 culverts. One of these culverts, CMP #4, has been identified as needing repair work because it is crushed, and because it lies above the stream grade causing a scour pool to form upstream from it. Other culverts within this road system have been inventoried, and determined to be in good condition. As mentioned above, sediment is being delivered to the intermittent stream by a short reach (200 feet) where the stream channel occupies the road ditch. This occurs on the main access road and is located on CSK Tribal lands.

Cold Water Fisheries

Montana Fish Wildlife and Parks reports that Finley Creek supports bull trout and westslope cutthroat trout in reaches below the analysis area. A survey completed by CSKT confirms the presence of westslope cutthroat trout in Finley Creek. These surveys were completed downstream from the proposed sale area. The reach of Finley Creek draining the analysis area is dispersed overland in an irrigated pasture and is therefore discontinuous with the stream reaches where fish surveys have been completed. No fisheries analysis has been completed for the uppermost reaches of Finley Creek where the sale area lies, however, an interview with longtime resident Sandy Lee Mercer on 2/3/99 provided information on the status of the fishery. According to this source, fish are present above the discontinuous, dry section near Mercer Lane. Montana DNRC hydrologists also observed trout in a stream draining the sale area. Bull trout and westslope cutthroat trout are likely to occur in these upper reaches of Finley Creek. Bull trout are listed as threatened and are protected under the provisions of the Endangered Species Act, and westslope cutthroat trout are listed as sensitive by the MT Department of Fish Wildlife and Parks. The MT DNRC analysis will assume the presence of both species.

Marent Gulch is a discontinuous ephemeral draw that does not provide fish habitat, or support a fishery.

SOILS

Soil Productivity

The proposed sale area is located on terrain of moderate to steep mountain sideslopes with some abrupt slope breaks and deeply incised draws that reflect the structural bedrock control of the landscapes. Bedrock is mainly Missoula group argillites, which are well fractured at depth, which forms skeletal soils with high gravel contents.

No especially unique or unstable terrain was noted in the project area. Bedrock is exposed along the ridgeline and upper mountain sideslopes. Most material should be common excavation for road construction, with the exception of the bedrock outcrops and very shallow soil areas that will require ripping for road construction. Material quality is excellent for roads and generally well drained.

Soil types are taken from The Missoula County Soil Survey. Vegetation type and surface soil depth vary by aspect with volcanic ash surface soils and moister sites more common on north aspects.

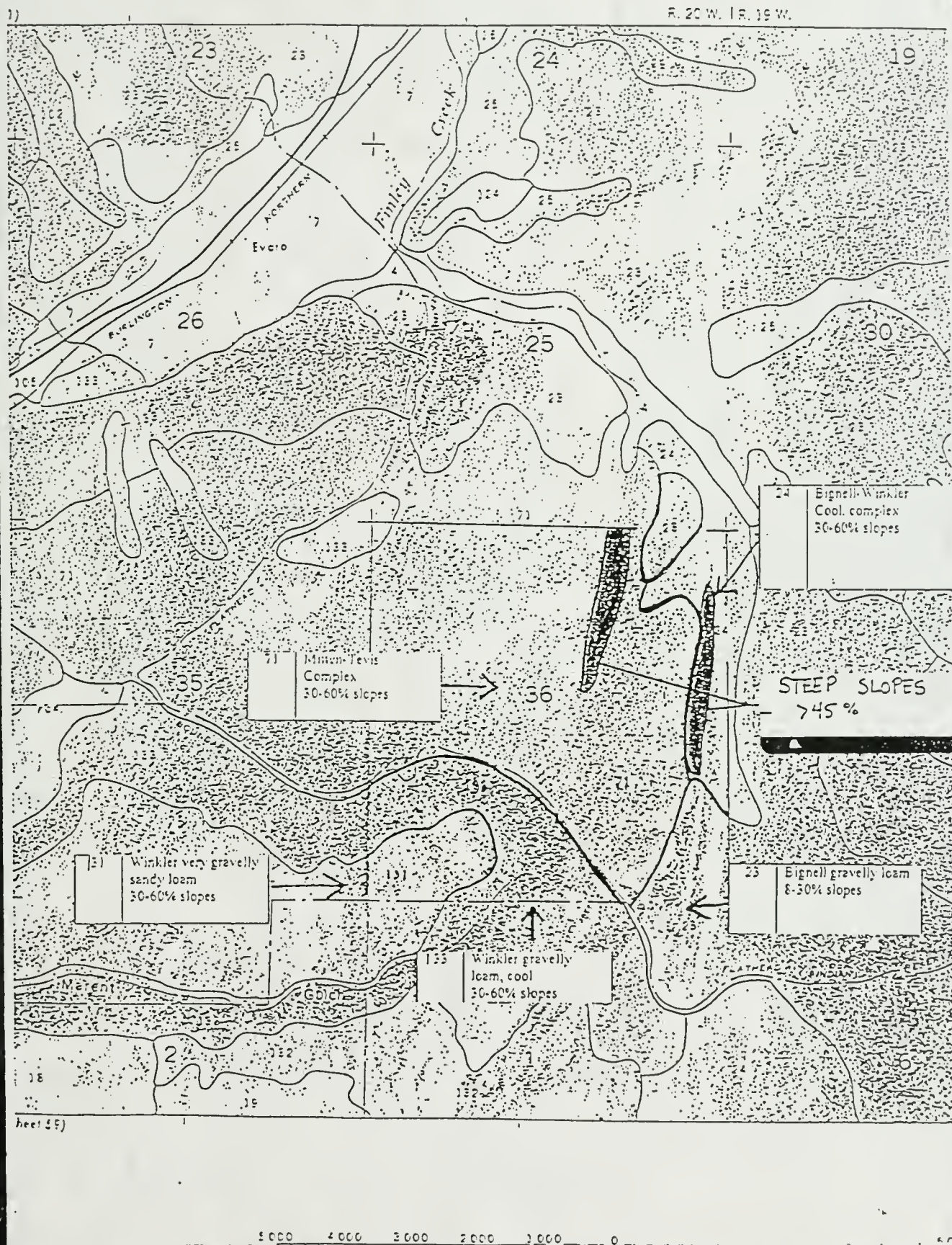
The dominant soil on north aspects is Mitten-Tevis terrain (Map unit 71) (Figure 3-2). Mitten soils are capped with ash are higher productivity sites and are usually found on flat to concave positions, swales/draws. Tevis soils are found on convex slopes where ash is absent. Both soils are well to somewhat excessively drained, shallow to moderately deep gravelly silt loams weathering from argillite with average slope ranges of 20-40% that are well suited to tractors. Steep slopes, in excess of 40%, are found along drainages. Soils are of high strength due to their skeletal nature. Compaction hazard is low except for ash caps. Due to the shallow nature of these soils the displacement hazard is high. Dominant tree species include: Douglas-fir, grand fir, and western larch with some lodgepole and ponderosa pine intermixed. Beargrass and huckleberry dominate the understory.

Winkler very gravelly sandy loam includes well drained to droughty, moderate to deep soils on mountain slopes of 30-60% in the SW ¼ of the section. Map unit 131 are Winkler soils on southerly aspects and are more droughty sites with shallower surface soils. These soils can be difficult to regenerate and are best suited to Ponderosa Pine and Douglas-fir. These sites are vulnerable to knapweed encroachment. Winkler map unit 133 occurs on northerly aspects and draws have moister vegetation, supporting PSME/PHMA, PSME/LIBO and beargrass phase habitat types (Pfister et al. 1977) on deeper surface soils of 6-8" very gravelly sandy loams. Volcanic ash surface soils are intermittent and where they occur in concave locations, (i.e., swales and draws) the site productivity is greater than the 131 Winkler.

Soil map unit 23 (Bignell gravelly loam) includes well drained, moderate to deep gravelly soils on toeslopes of 8-30%. Topsoils are gravelly loams over very gravelly clay weathering from alluvium with tertiary silt and clay. These soils drain slowly and stay wet later in the year. Compaction risk is severe when wet. This is a small part of the project area.

Figure 3-2

SOILS MAP



Map unit 24 (Bignell-Winkler cool complex) includes well drained, moderate to deep gravelly soils on mountain slopes of 30-60%. Bignell series topsoils are gravelly loams over very gravelly clay. Winkler topsoils are very gravelly sandy loams over extremely gravelly sandy loams. Erosion hazard is moderate. Displacement hazard is high, especially on slopes over 45%.

Most of the access road to Section 36 is in fair to good condition requiring maintenance and some additional drainage features at certain locations. The access road through Section 25 crosses deep alluvial soils and some segments of fine textured soils with lower rock contents. These low bearing strength soils tend to remain moist later in the year than other sites within the sale area and limit haul operations to dry or frozen conditions.

Cumulative effects to soil productivity within the State section are of some concern. However, future stand entries would likely use existing roads, trails and landings. Therefore, future entries would present low risk of cumulative effects.

Noxious Weeds

Recent road construction through the section is generally well vegetated with seeded grasses. There are spot occurrences of spotted knapweed along the main road in Section 25 and along the powerline access road in the eastern edge of the section. Knapweed also occurs in localized dense patches in the southern 1/4 of the section, particularly in the relatively open forested stands on south-facing slopes. These stands also provide winter range habitat. The section is contiguous with a large grass-shrub land to the south, so there is a constant source of knapweed seed to the area.

SENSITIVE PLANTS

A search of the Montana Natural Heritage program database showed no sensitive plant sites in the Evaro quadrangle. No sensitive plants were encountered within the project area during field review.

CHAPTER IV--ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter describes the environmental consequences or effects of the proposed action and the cumulative effects of concurrent and future state activities within the analysis area.

WILDLIFE

Old Growth and Snags

Alternative A—No Action

Without harvest, stands would continue to age and natural processes would continue to occur. In 50 years, stands that are currently 100 years old (the oldest in the project area), would meet the working definition for old growth. Without thinning or underburning, understories would become denser. Eventually, large-sized trees would experience increased competition stress from understory trees. They could die and be recruited into snags, a benefit to the snag resource and to old growth attributes to the stand. However, if medium-sized trees experience competition without thinning, they may not grow into the large-sized trees that are important for both old growth resources and as potential snag recruits. Remnant trees in the previously cut units would eventually have the potential to become snags or coarse woody debris; a benefit to snag and old growth resources. Without thinning, stands are at risk of loss due to stand-replacement fire. However, the risk is somewhat reduced in the project area because of current clearcut units in Section 36 and the 100-acre Northside Timber Sale unit located in Section 35. In addition, wildfire would likely still be suppressed.

In summary, without harvest, there would be no direct negative effects to old growth and snags, and there would be an increase in old growth and snags in the near-term. However, trees in unthinned stands would not be expected to grow as large as trees in thinned stands. If trees do not grow to at least 18 inches, then the benefit to both old growth and snags in the future would be lower than if trees grew larger. Remnant trees in the past cutting units would grow larger, because of low competition there. In addition, there is some risk to loss due to stand-replacing fire.

Cumulative Effects

In the project area, there would be a cumulative increase in snag and old growth resources as stands age. However, the benefit may not be as large as it could be due to competition stress among medium sized trees. Unit-wide, past DNRC sales are located too far from the project area to influence old growth or snag resources in the project area.

In the analysis area, cutting on the Flathead Indian Reservation (to the east) and Forest Service lands (to the west) has decreased old growth and snag resources. In addition, farms and hay meadows to the north have decreased forested cover and therefore, old growth and snag resources. Currently, potential sources for snag and old growth resources are located in Marent Gulch and on private land northwest of the project area (Figure 3-1, #6, #8). Marent Gulch is a south-facing slope and naturally open-grown. Therefore, old growth there would be expected to be open ponderosa pine or larch. The Lolo National Forest 1993 Northside Timber Sale did not harvest habitat in Marent Gulch, a net cumulative benefit to old growth and snag resources. In

addition, that sale thinned trees in Section 35, a benefit to old growth and snag recruitment in the long-term. Currently uncut private lands may be harvested in the future without any environmental review, a potential cumulative decrease in old growth and snag habitat in the future. Habitat security is currently low, due to trespass. As a result, some potential snag-recruitment trees have been removed.

Alternative B-Harvest

Harvest would emulate a cool to mixed severity fire disturbance, and generally would remove dense understory trees. All large-sized ponderosa pine and mistletoe-free western larch would be retained, except those removed for road, skid trail, or landing construction. This would recruit old growth ponderosa pine and large-sized snags faster than growing trees without thinning. In addition, risk of loss due to stand-replacement fire would be reduced in treated stands. Faster recruitment and reduced risk of loss are both direct benefits to old growth and snag resources. The area adjacent to the previously-harvested-stand 6 would retain large-sized Douglas-fir with mistletoe (Figure 3-1, #10). This important old growth component would increase structural diversity in that area, a benefit to old growth resources.

If any large-sized trees or snags are removed for logistical or safety considerations, there would be a direct negative effect to old growth and snag resources. However, effects would be minor, based on estimates of 5% loss or less from past sales. Direct effects would be mitigated by not entering 248 forested acres in the project area (Table 2-1), including all draws and the slope in the southwestern portion of the section (Figure 2-1). In addition, no remnant trees from past cutting units would be removed at this time. Slash would be return skidded to treated areas, so that coarse woody debris resources would not be negatively affected by harvest. (Note: another 40 acres in the project area would be unentered as well, but they are in the power line right-of-way and would not be available to grow to old growth in the near-term.)

Habitat security would increase after harvest, because roads that allow trespass access now would be closed. New roads and skid trails would be "slashed" (i.e., slash would be placed along the road surface). This discourages vehicle, foot, horse, and bicycle traffic, a benefit to snag and old growth resources. Slash placement would increase use of the unnaturally flat road surface by small mammals, birds, amphibians and reptiles.

Cumulative Effects

In the project area, there would be a cumulative benefit to old growth and snag resources by retaining large trees and thinning dense understories. Thinned stands would become old growth or produce large-sized trees and snags faster than unthinned stands. In the analysis area, past harvest in the power line corridor, on Reservation land, and private land to the north has removed many old growth components and suitable snag-recruitment trees. Therefore, thinning in the project area (and thus potentially recruiting old growth faster than without thinning) would benefit old growth-resources in the analysis area as well. Risk of loss due to stand replacement fire would also be reduced, a cumulative benefit to the analysis area.

Movement Corridors

Alternative A—No Action

Without harvest, previously uncut portions of the project area would continue to provide overstory cover and potential movement corridors. However, past fragmentation in Section 36 has decreased its utility for movement corridors. The largest trees (and crowns) may decline with increasing competition stress. No new roads or skid trails would be built, a benefit to habitat security. Trespass from Reservation land would continue. Without thinning, the risk of stand replacement fire would continue, a negative effect to movement corridors.

Cumulative Effects

In the analysis area, harvested Reservation lands provide little cover for movement corridors. Unharvested Forest Service lands provide movement corridors in Marent Gulch. The recent Forest Service harvest in Section 35 has some residual cover but is less suitable as a movement corridor now. However, roads there were obliterated, which increased habitat security more than if roads were still present. Given surrounding habitat alteration in the analysis area, retaining cover and movement corridors in the project area would provide a cumulative benefit to this resource.

Alternative B—Harvest

Harvest would decrease cover and potentially disrupt movement corridors in treated areas. However, no harvest would occur in draws and in the southwestern portion of the project area (Figure 2-1). These provide the best potential zones for movement corridors currently. In addition, no harvest would occur between units 3 and 6 of the previous sale. This is a relatively narrow habitat bridge approximately 600-700 feet wide. Logging there would potentially blend the 2 units together and decrease fragmentation. However, due to placement of the old units, there would be no alternative movement route to uncut areas in the southern portion of the section and to Marent Gulch. Therefore, keeping this area unlogged now would continue to facilitate movement both east and west as well as north and south through the project area. Harvest would decrease the risk of loss due to stand replacing fire, a benefit to maintaining movement corridors. Harvest in the southwestern portion of the project area, adjacent to stand 6 (previously harvested) would retain large-sized Douglas-fir with mistletoe. This would contribute to stand structure diversity and benefit arboreal movement potential through the area. Thinning would contribute to tree growth and increased crowns in residual trees—benefits to movement corridors.

In summary, there would be a negative effect to movement corridors by removing cover through harvest. Effects would be mitigated by leaving corridors unentered, growing larger trees with big crowns, and placing harvest units to maximize natural movement corridors toward Marent Gulch.

Cumulative Effects

Recently-cut Reservation lands provide little cover for movement corridors. Uncut Forest Service lands in Marent Gulch provide a natural corridor from east to west in the analysis area. Uncut portions of the project area would remain contiguous with this potential corridor (Figure 3-1, #6). Therefore, there would be no negative cumulative effect expected from this alternative. Thinning would reduce the risk of stand-replacement fire, a cumulative benefit to maintaining cover and corridors in the analysis area.

Winter Range

Alternative A—No Action

Without harvest, there would be no change from current conditions except that trees would gradually grow and understories would become denser. Cover would continue to increase, and forage would continue to decrease. No controlled burning would occur, a negative effect to forage resources. Cover adjacent to foraging areas would remain intact, a benefit to habitat security. However, vehicle trespass would continue to occur, a negative effect to security.

Cumulative Effects

In the analysis area, harvested habitat surrounding the project area provides little hiding, security or overstory cover for big game. Therefore, maintaining cover in the project portion of the analysis area would be a cumulative benefit to big game cover habitat.

Alternative B—Harvest

Harvest would decrease cover for big game, a negative effect to this habitat component. However, cover would remain intact in unentered areas. These include draws, habitat adjacent to the winter range openings in the southern portion of the project area, and potential movement corridors at the head of Marent Gulch (Figures 2-1). In addition, cover would remain unentered between current cutting units 3 and 6, a benefit to big game use there (Figure 2-1). Roads would be slashed after use, so security would not decrease after harvest. Trespass roads would be closed, a benefit to security. Thinning would decrease the risk of stand-replacement fire, a benefit to big game cover. Thinning would stimulate tree growth, so that crowns would increase, a benefit to snow interception for big game.

Cumulative Effects

In the southwestern portion of the project area, large-sized Douglas-fir with mistletoe would be retained in unharvested areas, to maintain overstory cover and habitat structure. This unharvested area is adjacent to recently cut Forest Service land in the analysis area that has little overstory cover now. Therefore, maintaining cover would mitigate cumulative effects of past harvest there. Other planning has maintained cover in the southeastern portion of the project area, adjacent to big game winter range areas in the analysis area (Figures 2-1). Therefore, there would be no net negative cumulative effects as a result of the project. Because trees with large crowns are rare in the analysis area, thinning in the project area that stimulates tree crowns and increases snow interception) would provide a cumulative benefit to adjacent areas in the analysis area.

WATERSHED

Cumulative watershed effects

Alternative A—No Action

Due to past harvest activities, current water yield is estimated at 5.8% above naturally occurring conditions. Under the no action alternative, vegetative recovery over time is expected to reduce water yield. Water quality is not expected to improve due to a chronic sediment source associated with an access road. No effects to fisheries are predicted under the no action alternative.

Alternative B-Harvest

A cumulative watershed effects analysis was completed to evaluate the potential hydrologic effects the proposed actions when combined with past or other ongoing activities. The DNRC proposal includes plans to harvest up to 220 acres of school trust lands utilizing shelterwood regeneration treatments. These treatments would remove approximately 66% of the existing crown cover from approximately 208 acres in the Finley Creek drainage, and 12 acres in the Marent Gulch drainage. The table below summarizes the proposed activities within the Finley Creek watershed analysis area:

Table 4-1 Summary of proposed activities in the Finley Creek watershed

Watershed	Proposed Harvest (acres)	Proposed Harvest ECA (acres)	Proposed Road Const. (mi.)
Finley Creek	208	137	1

The cumulative watershed effects analysis was completed using the Equivalent Clearcut Area (ECA) methods outlined in Forest Hydrology Part II (USFS 1974) in combination with utilizing information collected from surveys completed to determine the existing conditions of the affected watersheds (stream reach classification, stream inventory and channel stability ratings, sediment source surveys, road and stream crossing inventories). The results of the ECA analysis are summarized in the following table:

Table 4-2 Results of the ECA analysis

Watershed	Cumulative Harvest (acres)*	Cumulative ECA (acres)	% Watershed in Cumulative ECA	Cumulative WY Increase (% over Natural)
Finley Creek	980	839	24 %	7.2 %

*Cumulative Harvest, ECA and WYI Figures include all proposed and existing harvest activities and roads

The ECA method estimates potential increases in average annual water yield due to all known timber harvesting and road construction. Water yield increase (WYI) is a function of area harvested; level of canopy removal and amount of hydrologic recovery that has occurred due to tree regeneration. Cumulative harvest area is calculated and tracked through time as a comparable amount of equivalent clearcut area. Increases in water yield are expressed as a percentage increase over natural conditions.

Thresholds for allowable increases in water yield were established at 12-13% for Finley Creek by DNRC hydrologists. Thresholds were determined by utilizing a risk matrix contained in DNRC guidance developed for implementation of Watershed Resource Management Standards adopted under the State Forest Land Management Plan. Under this process; thresholds are determined by considering acceptable levels of risk, watershed sensitivity (runoff regime and

channel conditions) and downstream resource values (beneficial uses). Predicted cumulative water yield increase for the proposed activities on State lands is well within thresholds established for Finley Creek. It is therefore unlikely that the additional level of water yield increase predicted for Finley Creek under the Action Alternative would affect downstream channel conditions.

Water yield increase was not calculated for Marent Gulch due to the lack of a discernable stream channel. No impacts are anticipated in this analysis area due to the discontinuous and subsurface nature of runoff regimes draining this area, and the lack of affected downstream beneficial uses.

Water Quality

Harvest units can directly impact water quality if not properly located or buffered. The risk of impacts is greatest along streams, wetlands and lakes. The Streamside Management Zone Law (SMZ Law) regulates forest management activities that occur adjacent to streams, lakes and other bodies of water. All proposed harvest activities will be conducted in accordance with the SMZ Law and Rules. All areas requiring SMZ delineation have been field reviewed by a DNRC hydrologist to determine their adequacy in meeting the requirements of the law, and in protecting water quality and aquatic resources.

The primary risks to water quality are associated with roads, especially roads constructed along or crossing streams. Of particular concern is the stretch of the main access road where a tributary to Finley Creek occupies the road ditch causing chronic sediment delivery to this class III stream. Under the DNRC proposed action alternative this segment of road would be improved to meet Montana's Best Management Practices (BMPs). Some short-term impacts to water quality may occur due to sediment introduced at the stream crossing during or shortly after construction activities. Application of BMPs and site-specific designs and mitigation measures will reduce erosion and potential water quality impacts to an acceptable level as defined in the water quality standards. Acceptable levels are defined under the Montana Water Quality Standards as those conditions occurring where all reasonable land, soil and water conservation practices have been applied.

The proposed timber sale includes the construction of 1 mile of new road. This road construction will not involve any stream crossings. The proposal calls for these new roads to be closed, slashed, and abandoned after harvesting is completed. Through the application of BMPs for road design, construction, and drainage, and because of the lack of stream crossings, the new road is not expected to increase sediment delivery to Finley Creek or its tributaries.

The proposed improvement of the main access road is expected to result in long term improvements to downstream water quality and improved protection of beneficial uses in the affected watershed. There is little risk of adverse impacts to beneficial uses occurring as a result of the proposed action.

Cold Water Fisheries

The proposed timber harvest does not involve any harvesting in the SMZ therefore potential recruitment of large woody debris is not likely to be affected. By not harvesting in the SMZ stream shading will be maintained and water temperature should not be affected.

Implementation of the SMZ Law and Rules, Best Management Practices and site specific recommendations of the DNRC soil scientist and hydrologists will minimize the potential impacts of the proposed action on the cold water fisheries in the affected streams. The proposed road improvement is planned for a stream that is intermittent, is dispersed overland before entering Finley Creek, and is not likely to support any populations of fish or provide any fish habitat. Because of this, the proposed road improvement is not expected to cause a barrier to fish passage. The road improvement is designed to reduce sediment delivery to the stream by eliminating road ditch connectivity with the stream channel.

SOILS

Soil Productivity

The no-action alternative would have minimal effect to soils. Existing roads require some maintenance and additional drainage. With no action, roads would continue to erode and deteriorate.

Timber harvest, slash disposal and site preparation can cause rutting, erosion, soil compaction and displacement. Potential for soil impacts would be higher on tractor units and below average on cable units. On tractor units, the area of detrimental impacts would be limited to 15% or less of the harvest area, by implementing mitigation measures including season of use and skid trail limitations. Units that would be cable logged would have negligible effect on soils. Broadcast burning would have a short-term beneficial effect on soil nutrients.

Surface erosion occurs on portions of access roads. Most of the road system crosses well drained residual soils with high rock contents. Surface erosion can be effectively controlled by installing drainage features on roads and skid trails, followed by prompt revegetation of disturbed soils with site-adapted grasses. Potential soil impacts would be avoided or reduced to acceptable levels by implementation of BMPs and by following mitigations.

Noxious Weeds

Alternative A-No Action

Under the no-action alternative, noxious weeds would continue to spread along open roads and onto dry habitats in the SW ¼ of the section unabated. Knapweed can establish and may displace native plants on the higher risk habitats of Douglas-fir snowberry, pinegrass and bunchgrasses (Pfister et al. 1977). Noxious weeds can be found on lands adjacent to the project area and within the project area primarily on roads and in localized infestations.

Alternative B-Harvest

The action alternative would involve ground-disturbing activities that have the potential to introduce or spread noxious weeds in susceptible habitats. Once introduced, noxious weeds can displace native vegetation. For the action alternative, an Integrated Weed Management (IWM) approach was considered by DNRC to meet the intent of the Noxious Weed Law. For this project, we consider that a combination

of prevention, revegetation, and application of biocontrol and herbicide controls on spot outbreaks would be the most effective weed management treatment. While knapweed could establish on the north-facing aspects, it would likely be only isolated plants due to the competitive native vegetation. Where knapweed is currently limited to portions of existing roads (mainly on road edges), the DNRC would use herbicide treatments for effective control on site-specific areas. For the action alternative, see the IWM mitigation measures to reduce existing weeds and limit the possible spread of noxious weeds in the project area. Noxious weeds can be found on lands adjacent to the project area and within the project area primarily on roads and in localized infestations.

ECONOMICS

The costs related to the administration of the timber sale program are only tracked at the land office and statewide levels. The DNRC does not keep track of project-level costs for individual timber sales. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.

Estimated stumpage values were based on recent comparable timber sales on Missoula Unit. In addition, stumpage rates were adjusted due to differences in logging systems, log quality, and other factors. The estimated stumpage value including forest improvement fees would be \$245.00/Thousand Board Feet (MBF) for Alternative B.

The statewide revenue/cost ratios for DNRC for the last 5 fiscal years are listed below. Total return to the trust for this proposal is listed in Table 4-2.

FY 94	FY95	FY96	YF97	FY98
\$2.68	\$2.07	\$1.68	\$1.89	\$1.72

Table 4-2. Total return to the trust, by alternative

Alternative	Volume Harvested	Stumpage Value	Total Return to the Trust
A	0 MBF	\$0.00	N/A
B	Million Board Feet (MMBF) (1000 MBF)	\$245.00	\$250,000.00

APPENDIX A

ASSESSING OLD GROWTH: COARSE FILTER AND APPROPRIATE CONDITIONS

The SFLMP directs DNRC to “take a coarse filter approach to biodiversity by favoring an appropriate mix of stand structures and compositions on state land” (Montana DNRC Record of Decision, 1996). To implement the coarse filter, we first need to estimate how much area each cover type would occupy on the landscape under average conditions. We call these “appropriate conditions”. To determine appropriate conditions, we use our current Stand Level Inventory data. We classify stands into cover types that emphasize shade-intolerant (that is, sun-loving) tree species present. Shade-intolerant species are emphasized because they are currently under-represented in western landscapes, due to years of fire suppression and timber harvest. Table A-1 describes the protocol for assigning appropriate cover types from our current inventory. Once assigned, a stand is not evaluated again. This protocol is referred to as the Appropriate Conditions Filter.

TABLE A-1. PROTOCOL FOR ASSIGNING APPROPRIATE CONDITIONS BY COVER TYPE OLD-GROWTH COMMITMENTS FROM THE SFLMP					
Appropriate Cover Type*	Stepwise Proportional Representation (%) of Species To Determine Appropriate Cover Type				
	Ponderosa Pine	Douglas-Fir	Western Larch	Western White Pine	Lodgepole Pine
Western white pine (WWP)				10	
Ponderosa pine (PP)	20				
Western larch/Douglas-Fir (WL/DF)		Western larch/Douglas-fir 30 (western larch present)			
Douglas-fir (DF)		50			
Lodgepole pine (LP)					40
Subalpine types (ALP/NC)	Habitat type >630 and stands not yet assigned				
Mixed conifer (MC)	All remaining stands				
*Types were assigned in the order listed. Once assigned a stand was not subjected to subsequent assignment criteria. Hardwoods (HW) were not included. Current nonstocked areas for Missoula Unit (e.g., clearcuts) were tentatively classified as MC.					

For example, if the recent Stand Level Inventory shows that a stand is currently composed of at least 10% white pine, then the stand would be classified as an appropriate white pine stand. If a stand is currently 8% white pine, 12% ponderosa pine and 80% Douglas-fir, then the stand would be classified as an appropriate Douglas-fir stand. Local knowledge from foresters or inventory specialists may be used to adjust the results of the Appropriate Conditions filter for particular stands.

APPENDIX B

Endangered and Threatened Species

Mitigations common to all threatened and endangered species: If any threatened or endangered species were encountered during project planning or implementation, all project-related activities would cease and a DNRC wildlife biologist would be informed immediately. Additional habitat protection measures would be designed and implemented as appropriate.

Bald Eagle (federally-threatened)

Affected Environment

Bald eagles could occur in the project area. However, the birds typically nest within 1 mile of and forage on large bodies of water, usually greater than 40 acres. There are no large lakes or rivers within 1 mile of the project area. Bald eagles winter and nest along the Clark Fork River. At its closest, the river is approximately 8 miles from the project area. Bald eagles could forage on carrion in the proposed project area. To date, no bald eagles have been seen in the proposed project area, and none were recorded within 1 mile (Montana Natural Heritage Program Database, MNHD). However, bald eagles are reported to breed in this ¼ latilong (Montana Bird Distribution database, MBDD, latilong 14-D, <http://orion2.nris.state.mt.us>). Large-sized ponderosa pine trees are present in the vicinity, and this habitat component may be used by bald eagles for roosting and nesting. Roosting areas may be located miles from river and lake foraging areas. In addition, bald eagles could migrate through the area. The analysis area does not contain any large lakes or rivers, so potential bald eagle habitat is limited.

Environmental Consequences

Alternative A-No Action

Without harvest, understory trees would continue to grow. Large-sized trees, potentially used for bald eagle roosting or nesting, would experience increased competition stress. Eventually, this may cause large-sized trees to die and become snags. This would benefit the snag resource, which could be used by eagles for roosting or nesting. However, snags would not stand as long as live trees would. Also, without thinning, there would be fewer medium-sized trees to continue to grow to potentially become future large-sized trees, and eventually large snags. Trees may not become large enough to support nesting or roosting eagles. In addition, without thinning, fuels would increase and increase the risk of stand-replacing fire. Therefore, without harvest there would be no direct change to bald eagle habitat, and no potential disturbance from harvest activities.

Cumulative Effects

Without thinning, there would be a gradual cumulative decrease in roost tree habitat, as large-sized trees are lost from the site. This would occur in the project area and in uncut areas of the analysis area. Approximately ½ to 2/3 of the analysis area has been recently harvested. In those portions of the analysis area, there are few to almost no potential roost trees.

Alternative B-Harvest

Large-sized ponderosa pine trees are used by bald eagles for roosting and nesting, and this habitat component would be retained in the proposed harvest. No large (over 18 inches d.b.h.) ponderosa pine would be targeted for harvest, although some may be removed if they were in the path of planned roads or landings. Thus, after treatment the availability of large-sized ponderosa

trees would remain relatively unchanged. Harvest would generally not occur during spring (March 15-June 1), to avoid hauling on muddy roads. If eagles were going to nest in the area, they would be most vulnerable to disturbance during that time period. Therefore, potential disturbance to birds would be reduced because no activity would occur during spring. Spring feeding on carrion would potentially occur during that time as well. With spring shutdown, no negative effects to bald eagles would be expected to occur. After harvest, roads would be closed and slashed. Therefore, security on winter range areas where eagles may feed in spring would not be decreased by the project. Thinning would reduce the risk of stand-replacing fire, a benefit to roosting habitat. Therefore, with mitigation no direct negative impacts to bald eagles are expected to occur as a result of this project.

Cumulative Effects

Habitats in the analysis area are likely too distant from large lakes or rivers to affect bald eagle nesting habitat. Therefore, there would be no negative cumulative effects from the proposed alternative. Recently harvested portions of the analysis area have almost no roosting habitat. Therefore, thinning in the project area would promote pine growth into larger size classes, a cumulative benefit to bald eagle roosting habitat in the project area portion of the analysis area.

Grizzly Bear (federally-threatened)

Affected Environment

Grizzly bears may occur in the project area. Grizzlies are wide-ranging mammals that use forested upland habitats. The proposed harvest area currently provides canopy cover and potential movement corridors between large patches of forested habitat to the east in the Rattlesnake Wilderness area, and to the west in the Ninemile area. Corridors would be important for grizzly bears.

Habitats that are particularly attractive to grizzly bears include big game winter range areas, riparian zones, and avalanche chutes. These are areas that provide seasonally-important bear foods. The project area has riparian and winter range habitat, and is relatively secure due to current road closures.

Reservation lands in the analysis area provide limited residual cover for grizzly bears, but may have some foraging habitat. Private lands in the analysis area provide more extensive areas of overstory and hiding cover for grizzly bears. Forest Service lands include winter range slopes near Marent Gulch that have not been harvested. O'Keefe and Finley Creeks provide riparian foraging areas in the analysis area. However, both are located adjacent to high-traffic roads--including a federal highway--which limits habitat quality for bears.

Environmental Consequences

Alternative A-No Action

With the no action alternative, there would be no change from the current situation. Cover and potential movement corridors would remain intact, a benefit to grizzly bears. No new roads would be built—a benefit to grizzly bears. However, trespass would still occur—a continued negative impact. Overall, there would be no negative direct effects to this species.

Cumulative Effects

With the no action alternative, there would be no change from the current situation. Overall, there would be no negative cumulative effects to this species in the analysis area.

Alternative B-Harvest

Approximately ½ to ¾ mile of new road is planned for the project area. These would be obliterated with slash after harvest, so no direct negative effects would occur. In areas with current trespass, tank traps would be positioned to stop vehicle passage. Therefore, habitat security for grizzly bears would increase after harvest, a net benefit to grizzly bears. Cover would be retained in no entry areas between clearcut units 3 and 6 (Figure 2-1). This would facilitate movement between foraging areas and through the section. Overstory cover movement corridors would be retained in the southwestern corner of the section, adjacent to cover in Marent Gulch that connects to the west (Figure 3-1, #6). Cover for big game (prey for grizzly bears) would be retained associated with winter range openings in the southern portion of the section. Therefore, effects to cover important to big game would be negligible. Big game forage might be expected to increase where canopies are opened and more light reaches the understory. No harvest is planned in riparian areas, so that preferred bear foraging areas would be protected. With mitigation, there would be no direct measurable negative impacts to grizzly bears as a result of this project.

Cumulative Effects

Rehabilitation of road closures from trespass from adjacent lands would increase security for grizzly bears. This would contribute to a cumulative benefit to security in adjacent portions of the analysis area, if access is through Section 36. Although cover is limited on Reservation lands in the analysis area, a movement corridor would be maintained from east to west through Marent Gulch. This would mitigate any negative cumulative effect from removing cover. With mitigation, there would be no direct measurable negative cumulative impacts to grizzly bears as a result of this project.

Gray Wolf (federally-endangered)

Affected Environment

Gray wolves could use the proposed project area, although there are no documented dens in the analysis area (Ed Bangs, USFWS, pers. comm., July 21, 1999). Wolves are wide-ranging mammals that use forested upland habitats. Wolves have been documented to occur in the Ninemile area, approximately 15 miles from the project area. This is a short distance relative to wolf movement capabilities, although that group has generally stayed in the Ninemile area (Ed Bangs, USFWS, pers. comm., July 21, 1999). The proposed harvest area currently provides canopy cover and potential movement corridors between large patches of forested habitat to the east in the Rattlesnake Wilderness area, and to the west in the Ninemile area. Corridors would be important for wolves as well as for grizzly bears. Wolves are associated with areas that produce prey species, mainly big game and small mammals. Big game would be associated with the winter range in the project area. In addition, the habitat is relatively secure due to current road closures, although trespass occurs.

In the analysis area, Reservation lands provide limited residual cover for wolves. Private lands provide more extensive areas of overstory and hiding cover for wolves. Forest Service lands include winter range open-grown slopes near Marent Gulch and areas of residual cover.

Environmental Consequences

Alternative A—No Action

With the no action alternative, there would be no change from the current situation. Cover and potential movement corridors would remain intact, a benefit to wolves. No new roads would be built—a benefit to wolves, but trespass would still occur—a continued negative impact. Overall, there would be no negative direct effects to this species.

Cumulative Effects

With the no action alternative, there would be no change from the current situation. Overall, there would be no negative cumulative effects to this species.

Alternative B-Harvest

Approximately ½ to ¾ mile of new road is planned for the project area. These would be obliterated with slash after harvest, so no direct negative effects would occur. In areas with current trespass, tank traps would be positioned to stop vehicle passage. Therefore, habitat security for wolves would increase after harvest, a net benefit the species. Cover would be retained in no entry areas between clearcut units 3 and 6 (Figure 2-1). This would facilitate movement through the section. Overstory cover movement corridors would be retained in the southwestern corner of the section, adjacent to cover in Marent Gulch that connects to the west. Cover for big game (prey for wolves) would be retained associated with winter range openings in the southern portion of the section. Therefore, effects to cover important to big game would be negligible. Big game forage might be expected to increase where canopies are opened and more light reaches the understory. With mitigation, there would be no direct measurable negative impacts to gray wolves as a result of this project.

Cumulative Effects

Rehabilitation of road closures would increase security for gray wolves if access occurs through Section 36. A net cumulative benefit would result. Although cover is limited on Reservation lands in the analysis area, a movement corridor would be maintained from east to west through Marent Gulch. This would mitigate any negative cumulative effect from removing cover. With mitigation, there would be no direct measurable negative cumulative impacts to gray wolves as a result of this project.

Sensitive Species Considerations

Pileated Woodpecker

Pileated woodpeckers likely occur in the project area. They are associated with stands dominated by mature to old growth ponderosa pine or western larch. The birds prefer large-sized ponderosa pine and western larch snags and coarse woody debris for feeding, roosting and nesting. Nest trees are usually in snags at least 18 inches d.b.h. Large-sized snags and downed material—essential habitat features for pileated woodpecker foraging and nesting—are scattered in the project area. However, these large trees dominate no stands. Currently, pileated woodpeckers are not listed for this ¼ latilong (MBDD).

Recently-harvested Reservation lands in the analysis area provide limited pileated woodpecker habitat. Private lands provide more extensive areas of potential habitat in the analysis area, especially northwest of the project area. Forest Service lands likely provide pileated woodpecker habitat in the forested stands of the analysis area.

Flammulated Owl

Flammulated owls occur in mature to old growth ponderosa pine and mixed pine and Douglas-fir stands. The birds nest in cavities, and prefer those excavated by pileated woodpeckers where available. Nest trees in two Oregon studies were 22-28 inches d.b.h. (McCallum 1994). Habitats used have open to moderate canopy closure (30 to 50%) with at least 2 canopy layers, and often are adjacent to small clearings. In addition, stands used often have a shrub understory. An open forest structure with shrubs contributes to producing insects, the main prey of flammulated owls. Potential flammulated owl habitat occurs throughout the project area. However, the low number of snags and coarse woody debris limits habitat suitability. Flammulated owls are listed as likely breeding in this ¼ latilong (MBDD).

Recently-harvested Reservation lands in the analysis area provide limited flammulated owl habitat. Foraging habitat may occur, however. Forest Service lands provide more extensive areas of potential habitat in the analysis area, especially southwest of the project area in Marent Gulch. Adjacent openings from recent Forest Service harvest provide potential feeding areas in close proximity to potential nesting areas. Private lands in the analysis area likely provide flammulated owl nesting habitat, but limited foraging habitat.

Environmental Consequences

Environmental consequences will be discussed together with the flammulated owl, because these two species are closely associated with ponderosa pine.

Environmental Consequences, Pileated Woodpecker and Flammulated Owl

Alternative A—No Action

Without harvest, ponderosa pine and western larch trees would continue to experience competition stress. Trees would continue to die and potentially be recruited into snags, a benefit to pileated woodpeckers and flammulated owls. With increasing competition, however, fewer ponderosa pine and western larch trees would attain the large size (at least 18 inches d.b.h.) necessary to support pileated woodpeckers and flammulated owls. Therefore, without harvest, there would be a long-term decrease in nesting habitat for both bird species. There would also be a long-term decrease in foraging habitat (large-sized downed logs) for pileated woodpeckers. Additional roads would not be built, but trespass roads would not be effectively closed. Therefore, firewood cutting could continue to erode snag recruitment and retention. Without harvest, there would be a continued risk of stand loss due to stand-replacing fire. A stand-replacing fire would provide many snags in the short-term, but long-term nesting habitat would be decreased. Also, both species use areas with forest overstory cover, so an extensive stand-replacing burn would not provide preferred habitat. Therefore, without harvest a net negative impact to pileated woodpeckers and flammulated owls would be expected.

Cumulative Effects

In the project area, there would be a gradual cumulative decrease in nesting habitat for both species without thinning. If a stand replacing fire occurred, there would be a short-term increase in snags, but a long-term decrease in nesting habitat as snags are lost and not replaced. In the analysis area, recently-harvested Reservation lands have little habitat for either bird species, because large-sized trees, culls, and snags were not retained. Old cutting units could grow these components, but at least 100 years would need to pass. Uncut private lands to the northwest

have some large-sized ponderosa pine and western larch. With time, however, these components would die (a short-term benefit by creating snags) and not be replaced (a long-term negative effect for nesting habitat for both birds). Therefore, with no harvest, there would be a gradual cumulative loss of pileated woodpecker and flammulated owl habitat.

Alternative B-Harvest

The proposal would retain all of the ponderosa pine and mistletoe-free western larch greater than 18 inches d.b.h., except those removed for road, skid trail, or landing construction. Smaller ponderosa pines occur individually, so very few pine would be removed for thinning. Ponderosa pine retained would be expected to grow into larger sizes. Western larch is more numerous than ponderosa pine, and thinning of 8-15 inches d.b.h. western larch trees would occur. Thinning would encourage western larch growth into larger sizes, a benefit to both bird species. Some western larch is infected with mistletoe. If large-sized (greater than 18 inches) larch trees with mistletoe occur in a clump of several trees, the clump would be retained for wildlife habitat. This would partly mitigate the removal of individual western larch with mistletoe.

The proposal would remove understory Douglas-fir from ponderosa pine and western larch stands, thus promoting continued growth of pine and larch. Therefore, over time large-sized ponderosa pine and western larch trees and snags would be recruited into the stand. Recruiting these preferred tree species would benefit both birds. Thinning would reduce the risk of stand-replacing fire. No snags would be removed, unless they were a danger to humans for safe harvesting operations. Road-building could open more habitat to trespass firewood cutting, a negative effect to both species. Slashing roads would mitigate this effect. In addition, ineffective road closures would be improved to discourage trespass, a benefit to retaining snags. Machinery would break up some coarse woody debris, but this would be partially mitigated by return skidding slash and leaving large pieces of coarse woody debris after harvest. If stands are burned and trees are killed, no large ponderosa pine or western larch trees would be salvaged. Thus, no direct negative effects to pileated woodpeckers or flammulated owls are expected to occur as a result of this project. A net positive effect is expected due to thinning under large-sized ponderosa pine and western larch, and retention of cull and healthy large-sized pine and larch.

The proposed harvest of understory Douglas-fir trees would increase potential flammulated owl foraging habitat in the area. No harvest would occur in draws and along the southeastern portion of Section 36. Therefore, birds could move through the section without crossing large openings. Therefore, no appreciable direct negative effects to either species are expected to occur as a result of this project. A net positive effect is expected due to thinning under large-sized ponderosa pine and western larch.

Cumulative Effects

Thinning from under large ponderosa pine and western larch in the project area would provide a net cumulative benefit for both bird species. Thinning would help reduce risk of stand-replacing fire in the analysis area. Little habitat for either bird species remains in the eastern portion of the analysis area. The western area has more uncut and therefore potential nesting habitat, but it would gradually decrease without thinning there. The uncut area in the southern portion of the project area would facilitate movement between the east and west sides of the analysis area. Overall with this alternative, there would be a cumulative benefit to nesting habitat from thinning for both bird species.

Lynx

Affected Environment

Potential denning habitat consists of relatively dense stands (at least 50% canopy closure) of mature to old growth structure at 5,000 feet elevation or higher, in spruce-fir habitats that contain numerous downed logs. Elevations in the project area range from 4,320 to 5,110 feet elevation. However, most of the stands are warm and dry, not the cool and moist types that provide potential lynx denning habitat. The exception would be the ABGR/LIBO habitat type (Pfister et al. 1977) areas. Stands in the project area have limited value as potential lynx denning habitat, however, because they are relatively small habitat patches. In addition, the stands are not mature to old growth, and have few large downed logs for potential denning habitat.

Snowshoe hares are important lynx prey that are associated with young dense, lodgepole pine stands. Although lodgepole pine occurs in the old cutting units, they are not composed exclusively of dense lodgepole pine. The old cutting units likely support some snowshoe hares, however.

Recently-harvested Reservation lands in the analysis area provide limited cover for lynx, but potential foraging habitat. Private lands to the northwest provide more extensive areas of potential habitat in the analysis area. However, Highway 93 and the town of Evaro fragment this patch of habitat.

Environmental Consequences

Environmental consequences for lynx, fisher, and boreal owls will be discussed together.

Fisher

Affected Environment

High-quality fisher habitat consists of late-successional forests with dense canopies in close proximity to riparian areas. Elevations are usually less than 6,000 feet. Preferred cover types found in the analysis area are in Finley Creek, a perennial stream. Within the project area, there are no permanent riparian areas. Current low densities of coarse woody debris and large-sized snags also limit habitat value of the project area to fisher.

Recently-harvested Reservation lands in the analysis area provide limited cover for fisher. Private lands to the northwest provide more extensive areas of potential habitat in the analysis area. Although old growth trees are present, the stands are not composed of old growth. The largest perennial streams in the analysis area are adjacent to roads, which lowers the streams' habitat value to fisher.

Boreal Owl

Affected Environment

Preferred boreal owl habitat includes spruce and fir habitats from 5,000 to 8,000 feet elevation. The project area contains 20-30 acres of ABGR/LIBO habitat type (Pfister et al. 1977) on north-facing slopes, but most is located too low in elevation to be preferred. Other areas have already been harvested. Boreal owls have been found nesting in mixed conifer and Douglas-fir stands in Idaho (Hayward 1994), and could occur in the project area, however. None have been recorded for this ¼ latilong (MBDD).

Recently-harvested Reservation lands in the analysis area provide almost no boreal owl habitat. Private lands provide more extensive areas of potential habitat in the analysis area, especially northwest of the project area. However, elevations are lower than in the project area.

Environmental Consequences Lynx, Fisher, and Boreal Owl

Alternative A-No Harvest

Without harvest, there would be no change from current conditions, except those from successional processes. Almost none of the project area is now preferred habitat for any of the three species. With time and tree growth, some stands may become old growth. However, the project area would still be dominated by lower elevation than preferred for lynx and boreal owls, and dryer habitats than preferred for fisher. Without thinning, large-sized trees may die and not be replaced, a potential negative effect to lynx, fishers, and boreal owls. Overall, there would be no direct negative effect to the 3 species without harvest.

Cumulative Effects

Without harvest, large trees would continue to experience competition stress. Medium-sized trees would not be recruited into large-sized trees without thinning or disturbance. Eventually the number of large-sized trees would decrease. This would be a cumulative negative effect to lynx, fisher, and boreal owl habitat. With increased understory tree growth, fuels would increase. This would result in an increased risk of stand-replacement fire. Due to recent past harvest, Reservation lands in the eastern portion of the analysis area would continue to provide almost no habitat for lynx, fisher, or boreal owls in the near-term. Private land in the analysis area, located northwest of the project area, is too low in elevation to provide preferred habitat for lynx and boreal owls. Also, the stands are not dominated by old growth, so they would not be preferred for fisher. Without thinning, there would be a gradual decline in large trees, an important habitat component for lynx, fisher, and boreal owls. However, cumulative negative effects from loss of large trees would be lower than if the habitats were more moist or located at higher elevations.

Alternative B-Harvest

The proposed harvest would remove cover, a potential negative effect to all three species. However, this would be mitigated by leaving unentered cover in draws and along the southern portion of Section 36. This habitat would facilitate movement for all three species through the section. Road-building would be a negative effect to all three species. However, this would be mitigated by slashing new roads and by effectively closing roads that currently allow trespass. Large-sized trees would be retained and thinning would promote their growth. With time, these could provide the raw materials for large snags and coarse woody debris, a benefit for all three species. Therefore, no appreciable direct negative impacts to lynx, fisher, or boreal owls would be expected as a result of this project. Benefits would result from potential recruitment of large-sized trees. However, the benefit would not be as great as if the project area were located at higher elevations or composed of more moist types.

Cumulative Effects

Cover is limited in the analysis area due to past harvest on Reservation lands. The proposed harvest would remove more cover, a negative cumulative effect to these 3 species. However, negative effects would be mitigated by retaining unentered cover in draws and along the southern portion of Section 36. Cover would facilitate potential movement through the analysis area from east to west. Thinning would promote continued growth of large-sized trees, a cumulative benefit

to all 3 species. However, the benefit would not be as great as if the project area were located at higher elevations and composed of more moist types.

Townsend's Big-eared Bat

Affected Environment

There are no known caves (that is, winter roosting habitat) in the project or analysis areas. Snag habitat (potentially used for summer roosting) occurs in the project area.

Recently harvested Reservation lands in the analysis area provide almost no snag habitat. Private lands provide more extensive areas of potential habitat in the analysis area, especially northwest of the project area.

Environmental Consequences

Without winter roosting habitat, it is unlikely that the project area supports Townsend's big-eared bats. Effects to snag habitat, potential summer habitat, are covered in Chapter 4, Environmental Consequences. Actions that promote snag retention and potential recruitment would benefit Townsend's big-eared bats. Given the low likelihood of finding this species, neither alternative would be expected to have any direct or cumulative negative impacts to this species.

OTHER SENSITIVE SPECIES

The following are sensitive species that occur on lands administered by the Southwestern Land Office. We examined habitats in the project and analysis areas, and information in the Montana Natural Heritage Program Database, and Montana Bird Distribution Database for each species. Due to limited available habitat and no confirmed records, we consider the species would not likely occur near the project area. Therefore, no direct or cumulative effects are expected for any of the species as a result of either alternative.

Black-Backed Woodpecker

No recent stand-replacement burns, major insect infestations, or decadent lodgepole pine stands occur on or near project area. It is likely there is no resident population of black-backed woodpeckers in the project area or in the cumulative effects analysis area. Therefore no further analysis is necessary.

Coeur d'Alene Salamander

No fractured rock, waterfalls or splash zones occur in the project area.

Columbian Sharp-Tailed Grouse

No extensive grassland or shrub-steppe habitat occurs in the project area. This species is only documented from northwestern Montana, near Eureka.

Common Loon

No large lakes occur in the area.

Ferruginous Hawk

No extensive grassland habitat occurs in the project area. Grassland occurs near Marent Gulch, southwest of the project area. Open habitats would not be affected by this project. There are no records for this species in the ¼ latilong (mtnhp@nris.mt.gov).

Harlequin Duck

White-water habitat is absent.

Northern Bog Lemming

No fens, bogs, or substantial moss-dominated areas are present.

Mountain Plover

Shortgrass prairie habitat or prairie dog towns do not occur in the area.

OTHER SPECIES OF INTEREST

Goshawk

Affected Environment

Goshawks nest in relatively dense late-successional forests, usually in close proximity to water. Downed logs provide habitat for goshawk prey, and goshawks forage in a variety of forest structural stages, including openings. The project area provides potential goshawk habitat, although none have been recorded for this ¼ latilong (mtnhp@nris.mt.gov).

Environmental Consequences

Alternative A—No Action

Without harvest, goshawk habitat should remain as is currently. Eventually, large trees may become more scarce without thinning. However, goshawks can nest in medium-sized trees as well, so negative effects would not necessarily occur without harvest. There may be a gradual increase in decadence, a net cumulative benefit to prey habitat for goshawks. As stands become denser, foraging habitat may decrease. However, ample opportunity is available on adjacent harvested land. Overall, there would be little change to goshawk habitat, unless the stands were lost to a catastrophic event.

Cumulative Effects

Without harvest, large trees would continue to experience competition stress. Medium-sized trees would not be recruited into large-sized trees without thinning or disturbance. Eventually the number of large-sized trees would decrease. This would be a cumulative negative effect to goshawk habitat. With increased understory tree growth, fuels would increase. This would result in an increased risk of stand-replacement fire. Due to recent past harvest, Reservation lands in the eastern portion of the analysis area would continue to provide almost no nesting habitat for goshawks, although foraging habitat would be available. Private land in the analysis area, located northwest of the project area, provides more extensive habitat. Overall, there would be no negative cumulative effects to goshawks as a result of this alternative.

Alternatives B Harvest

Harvest would have some direct negative effect to goshawk habitat by removing potential nest trees. Retaining large-sized trees would mitigate negative effects. There would be a cumulative benefit to large trees from thinning, which would reduce competition stress and the risk of stand-replacing fire. Return skidding of slash would provide coarse woody debris for small mammals after harvest. Therefore, suitable prey habitat should not be limiting after the harvest. Thus, no direct negative impacts to this species are expected to occur as a result of this alternative.

Cumulative Effects

Cover is limited in the analysis area due to past harvest on Reservation lands. The proposed harvest would remove more cover, a negative cumulative effect to goshawks. However, negative effects would be mitigated by retaining unentered cover in draws and along the southern portion of Section 36. Thinning would promote continued growth of large-sized trees, a cumulative benefit to goshawks. Thus, no direct negative impacts to this species are expected to occur as a result of this alternative.

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